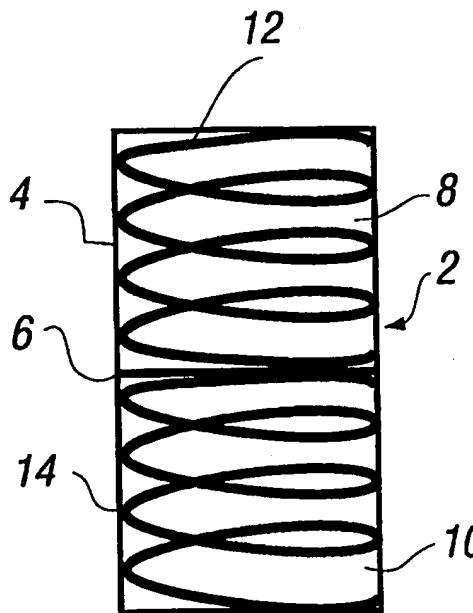


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(54) Title: SPRING UNITS			
(57) Abstract			
<p>The invention discloses a spring unit (2) for use in a sprung unit such as a bed, divan bed, mattress, or other upholstered unit, the spring unit comprising a pocket (4) of fabric or other suitable material and having at least two sub-pockets (8, 10), each of said sub-pockets containing a resilient member (12, 14). The pocket will preferably be divided across, laterally, or diagonally so as to form said at least two sub-pockets. The spring unit may be formed with two sub-pockets or three or more sub-pockets each containing a resilient member. The sub-pockets may be of equal length or of differing lengths, and the resilient members will preferably be springs which may be of equal lengths or of differing lengths and of equal or differing rates of compression. The pocket will be divided by fabric or other suitable material which is integral with the pocket or by discrete piece(s) of fabric or other suitable material secured to said pocket to form said sub-pockets.</p>			
			

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**SPRING UNITS**

This invention relates to spring units for use in sprung units such as, for example, beds, divan beds, mattresses, upholstered items and the like,

05 and the invention is more particularly concerned with pocketed spring units for use in such articles.

A pocketed spring unit generally consists of a pocket of fabric or other suitable material in which is located a spring, the ends of the pocket

10 being closed so as to retain the spring within the pocket. Such a pocketed spring unit comprises a single pocket and a single spring within said pocket, a plurality of such pocketed spring units being used in the formation of a sprung unit such as is referred to above.

15 According to the present invention there is provided a spring unit comprising a pocket of fabric or other suitable material and having at least two sub-pockets, each of said sub-pockets containing a resilient member.

20 Said pocket will preferably be divided across, laterally, or diagonally,

Said resilient members will preferably be springs, and said sub-pockets may be of equal length or of differing lengths.

05

Said pocket will preferably be divided by fabric or other suitable material which is integral with the fabric or other suitable material of said pocket. Alternatively, said pocket may be divided by discrete piece(s) of fabric or other material which is secured to said pocket so 10 as to form said sub-pockets.

Said springs, at least when housed or contained in said sub-pockets, and/or prior to being housed or contained in said sub-pockets, will be of equal or unequal lengths, and said springs will have equal or 15 differing rates of compression.

In order that the invention may be more readily understood, embodiments thereof will now be described, by way of example only, reference being made to the accompanying drawings, wherein:  
20 Figure 1 is a schematic representation of a spring unit according to a

first embodiment of the invention;

Figures 2 to 6 illustrate further embodiments of the invention; and

05 Figure 7 illustrates one example of a sprung unit incorporating a plurality of spring units according to the invention.

Throughout the following description and in the ensuing claims, the

term 'pocket' is to be taken to include a single pocket formed from a

10 single piece or a plurality of pieces of fabric or other suitable material, or two or more pockets secured together to form a single composite pocket, so the description and claims should be construed accordingly.

Referring to the drawings, and firstly to Figure 1, a spring unit,

15 indicated generally by reference numeral 2, comprises a single pocket 4 of fabric or other suitable material which is closed at its extremities and which is divided laterally by a length or web of the fabric or other suitable material - indicated by reference numeral 6 - so as to form in said pocket 4 two sub-pockets 8 and 10. As will be seen, the sub-  
20 pockets are of the same length or substantially of the same length.

The length or web 6 of fabric or other suitable material is integral with  
the fabric or other suitable material of the pocket 4, and is formed or  
05 positioned by heat welding, sonic welding, or stitching during the  
formation of the spring unit.

Located in each of the sub-pockets 8 and 10 is a coil spring 12 and 14  
respectively, the springs being retained in the sub-pockets by the length  
10 or web 6 and the closed extremities of the sleeve.

The springs 12 and 14, both in their uncompressed states and when  
located in their respective sub-pocket, will preferably be of the same  
length and have equal rates of compression, but it will be understood  
15 that the springs 12 and 14, at least when not located in the sub-pockets,  
may be of differing lengths, and in addition may have differing rates of  
compression.

Referring now to Figure 2, a spring unit, indicated generally by  
20 reference numeral 20, is essentially the same as the spring unit of

Figure 1, in that the spring unit comprises a single pocket 22 of fabric or other suitable material, is closed at its extremities, and has a lateral

05 length or web 24 of fabric or other material so as to form in said pocket 22 two sub-pockets 26 and 28. As will be seen from Figure 2, the lengths of said sub-pockets 26 and 28 are different, that of the upper sub-pocket 26 being less than that of the lower sub-pocket 28.

10 Each of the sub-pockets 26 and 28 contain a spring, respectively referenced 30 and 32, the springs being retained in position as described above with reference to Figure 1.

As will be seen, the spring 32 is of a greater length than the spring 30

15 when the springs are housed or contained in the sub-pockets 28 and 26, although it will be appreciated that the springs may be of equal length or differing lengths when free of said sub-pockets, and as referred to in connection with Figure 1, the rates of compression of the springs 30 and 32 may be the same or such rates of compression may be

20 different.

Figure 3 shows a 'three-up' spring unit, indicated generally by reference numeral 40, which comprises a single pocket 42 which is divided into three sub-pockets 44, 46, and 48 by lateral lengths or webs 50 and 52, the lengths or webs being integral with the fabric or other suitable material of the pocket 42. As will be seen, the sub-pockets 44, 46, and 48 are of equal or substantially equal length.

10 Each of the sub-pockets 44, 46, and 48 contain a spring, respectively referenced 54, 56, and 58 which, when located in their respective sub-pockets, are of the same length. It will be appreciated however, that in their free states the springs may of equal or differing lengths. In addition, and as previously referred to, the rates of compression of the 15 springs may be the same or they may differ.

Figure 4 shows a variation of the spring unit of Figure 3, the spring unit 60 in this case having equal length upper and lower sub-pockets 64 and 66, and an intermediate sub-pocket 68 located between said upper and 20 lower sub-pockets, formed in the pocket 62. The sub-pockets 64, 66,

and 68 are formed as previously described by integral lengths or webs 70 and 72.

05

Springs 74, 76, and 78 are located in the sub-pockets 64, 66, and 68, and as previously referred described, the springs may have the same length or differing lengths, and their rates of compression may be the same or different.

10

Figure 5 illustrates a variation of the spring unit of Figure 4. In the embodiment of Figure 5, the spring unit 80 has a pocket 82 divided into three sub-pockets 84, 86, and 88 by lengths or webs 96 and 98 integral with the fabric or other material of the pocket, the sub-pockets 15 84 and 88 being of the same length and of a greater length than the sub-pocket 86.

The springs 90, 92 and 94 located in the respective sub-pockets 84, 86, and 88 may have varying lengths when not located in the sub-pockets 20 or they may be all of the same length, and their rates of compression

may, as with the previous embodiments, be the same or they may differ.

05

In each of the above-described embodiments, instead of the lengths or webs of fabric or other material being integral with the fabric or other material of the pocket, such lengths or webs may be constituted by discrete pieces of fabric or other material suitably secured in position

10 to the pocket.

Referring now to Figure 6, this illustrates a spring unit indicated generally by reference numeral 100 which consists of two separate spring units 102 and 104, each comprising respectively a pocket 106 and 108, having closed upper and lower extremities, and housing or containing a spring 110 and 112, the pockets being joined together at the juncture of the lower extremity 106A of the upper pocket 106 and the upper extremity 108A of the lower pocket 108 so as to form a single composite pocket containing two sub-pockets referenced 114 and 116.

The sub-pockets 114 and 116 are of equal or substantially equal length, and the springs contained therein, whilst of the same length when 05 located or housed in said sub-pockets, may be of differing lengths or of the same length when free of said sub-pockets. In addition, the rates of compression of said springs may be the same or they may differ.

Although the springs illustrated in Figures 1 to 6 are shown as being 10 coil springs, it will be appreciated that such springs may be barrel springs, or indeed any other suitable form of spring or other resilient means such as foam or other resilient material pads.

It will be appreciated that whilst Figures 1 to 6 show the length or web 15 of fabric or other suitable material extending laterally, i.e. from side to side, of the pocket and generally parallel to the ends of the pocket, the length or web of fabric or other material may extend between diagonally opposed 'corners' of the pocket and/or at any suitable position between that position and the positions illustrated in Figures 1 20 to 6.

Figure 7 illustrates part of a sprung unit 120 - for example a bed, divan bed, or mattress - which incorporates a plurality of the spring units 05 according to the invention. The illustration shows the sprung unit 120 incorporating a plurality of the spring units 20 of Figure 2. It will be seen that the spring units 20 are arranged such that adjacent spring units are in reversed positions, i.e. the spring 30 of one unit is uppermost, whilst in the adjacent spring unit the spring 32 is uppermost.

10 Thus the sprung unit is given a variation in firmness at different stages of compression of the spring units throughout the sprung unit when a user's weight is applied to the sprung unit. This is due to the fact that, 15 for example, the springs 30 will not be compressed further until such time that the springs 32 have been compressed and are substantially the same length as the springs 30.

It will be appreciated that the spring units within the sprung unit 120 may all have the same orientation, i.e. the springs 30 will always be 20 uppermost and the springs 32 lowermost or vice versa.

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It will also be appreciated that the sprung unit 120 may incorporate a plurality of the spring units of Figure 1 or of any of Figures 3 to 6, or  
05 indeed any combination of the spring units of Figures 1 to 6.

Thus the invention provides spring units for incorporation into a sprung unit, the form of the spring unit and the arrangement of a plurality of spring units within the sprung unit giving the sprung unit a variable  
10 'spring count' and a variation in the firmness at different stages of compression of the springs of said spring units.

15

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## CLAIMS:

05 1. A spring unit comprising a pocket of fabric or other suitable material and having at least two sub-pockets, each of said sub-pockets containing a resilient member.

2. A spring unit according to Claim 1, wherein said pocket is divided across, laterally, or diagonally, so as to form said at least two sub-pockets.

10 3. A spring unit according to Claim 1, wherein said resilient member is a spring.

15 4. A spring unit according to Claim 2, wherein said pocket is divided laterally so as to form two sub-pockets each containing a spring.

5. A spring unit according to Claim 2, wherein said pocket is divided laterally so as to form three or more sub-pockets each containing a

20

spring.

05 6. A spring unit according to any of Claims 1 to 5, wherein said sub-pockets are of equal length.

7. A spring unit according to any of Claims 1 to 5, wherein said sub-pockets are of differing lengths.

10 8. A spring unit according to any of Claims 2 to 7, wherein said pocket is divided by fabric or other suitable material which is integral with the fabric or other suitable material of said pocket.

15 9. A spring unit according to any of Claims 2 to 7, wherein said pocket is divided by discrete piece(s) of fabric or other suitable material which is secured to said pocket so as to form said sub-pockets.

20 10. A spring unit according to any of Claims 2 to 5, wherein said

springs are of equal length prior to and when housed or contained in said sub-pockets.

05

11. A spring unit according to any of Claims 2 to 5, wherein said springs are of differing lengths prior to being housed or contained in said sub-pockets.

10 12. A spring unit according to Claim 7, wherein said springs are of equal length prior to being housed or contained in their respective sub-pockets.

13. A spring unit according to Claim 7, wherein said springs are of 15 different lengths both prior to and when housed or contained in their respective sub-pockets.

14. A spring unit according to any of Claims 3 to 13, wherein said springs have the same rate of compression or differing rates of 20 compression.

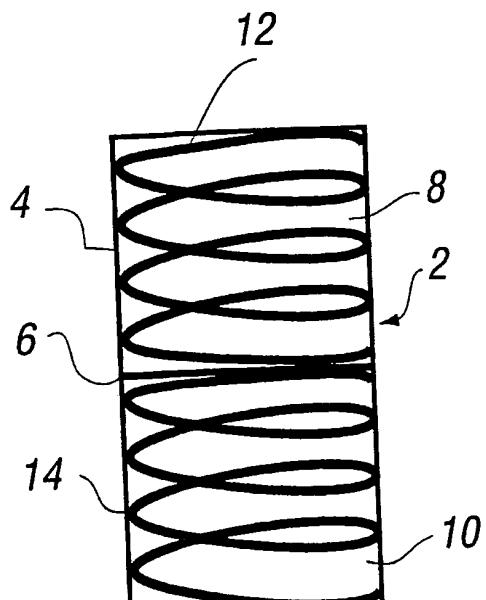
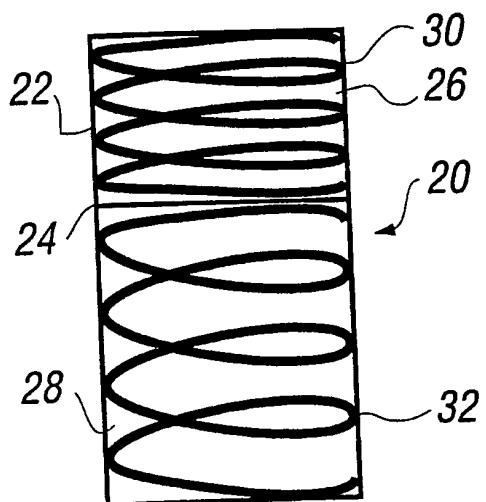
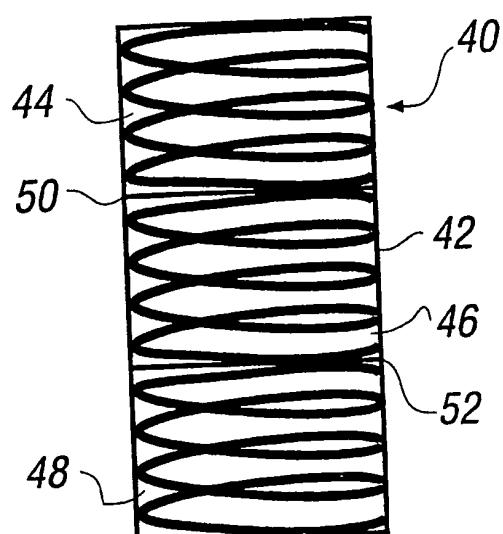
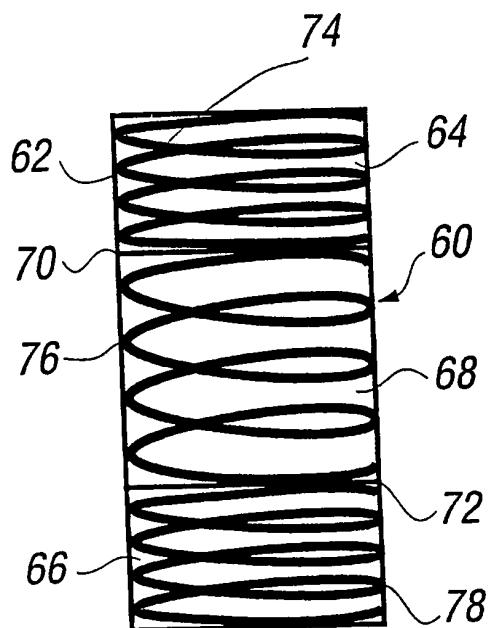
- 15 -

15. A sprung unit such as a bed, divan bed, mattress, or other  
upholstered unit incorporating a plurality of spring units according to  
05 any of Claims 1 to 14.

10

15

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FIG. 1FIG. 2FIG. 3FIG. 4

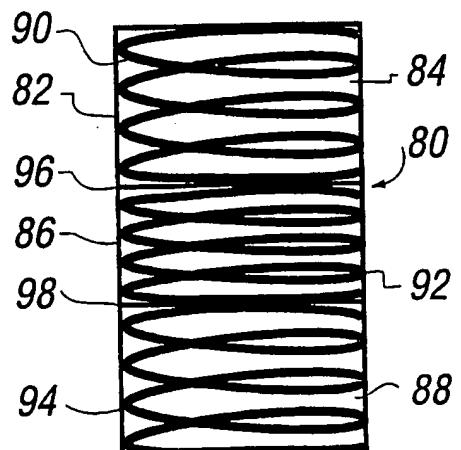


FIG 5

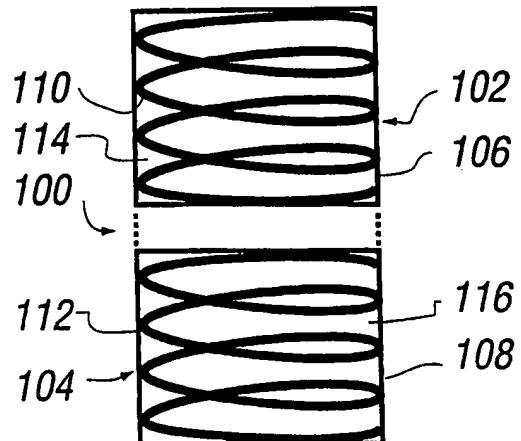


FIG 6

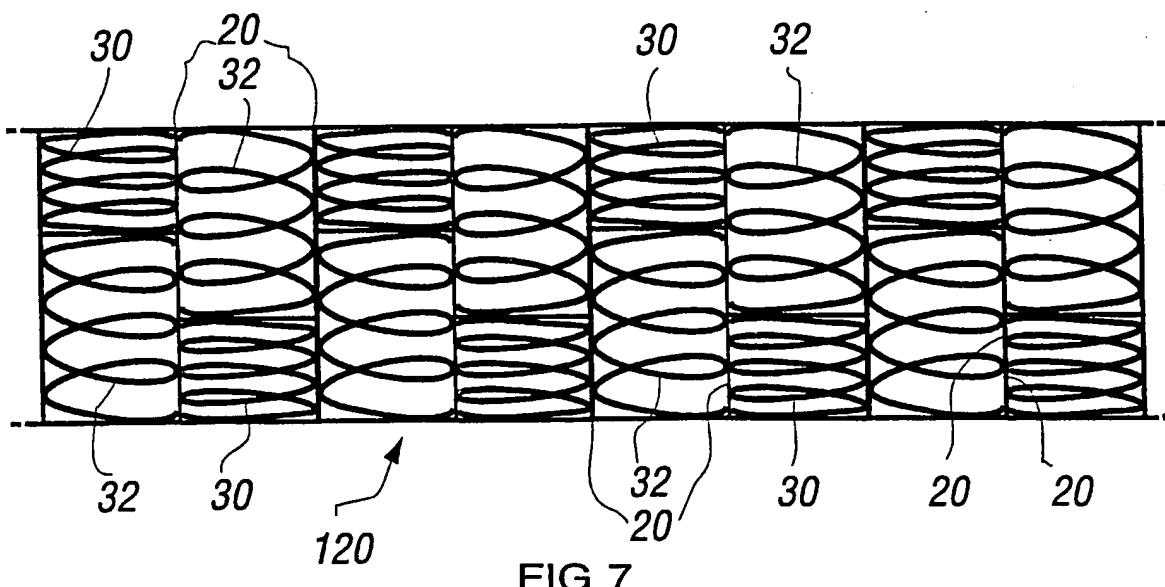


FIG 7

# INTERNATIONAL SEARCH REPORT

International Application No  
PCT/GB 99/02015

**A. CLASSIFICATION OF SUBJECT MATTER**  
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According to International Patent Classification (IPC) or to both national classification and IPC

**B. FIELDS SEARCHED**

Minimum documentation searched (classification system followed by classification symbols)  
IPC 6 A47C

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

**C. DOCUMENTS CONSIDERED TO BE RELEVANT**

Category	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	WO 98 25503 A (A HARRISON) 18 June 1998 (1998-06-18) claims 1-9; figures	1,3,14, 15
A	---	2,4-13
A	US 3 462 779 A (THOMPSON) 26 August 1969 (1969-08-26) claim 1; figures	1-15
A	US 1 741 847 A (KASPAR) 31 December 1929 (1929-12-31) claim 1; figures	1-15

Further documents are listed in the continuation of box C.

Patent family members are listed in annex.

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PCT/GB 99/02015

Patent document cited in search report	Publication date		Patent family member(s)	Publication date
WO 9825503	A 18-06-1998	AU	3351697 A	03-07-1998
US 3462779	A 26-08-1969		NONE	
US 1741847	A 31-12-1929		NONE	

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